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(54) **STERILIZATION TRAY**

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See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

5,211,915 A 5/1993 Monch  
5,759,490 A 6/1998 Malchesky  
(Continued)

**FOREIGN PATENT DOCUMENTS**

WO 93/17727 A1 9/1993  
WO 2008/020770 A1 2/2008

**OTHER PUBLICATIONS**

European Patent Office Communication for European Application No. 18 209 450.8, dated May 13, 2020, 16 Pages.  
(Continued)

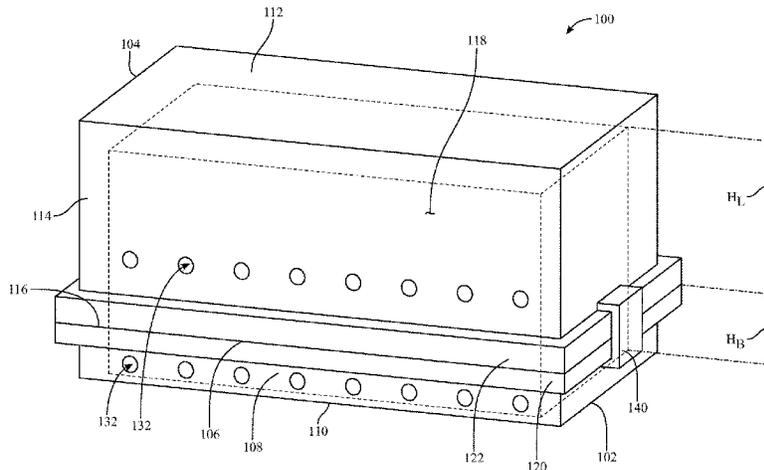
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(57) **ABSTRACT**

A sterilization tray is disclosed herein. A medical instrument, such as an endoscope, may be placed into the sterilization tray, and the sterilization tray with the medical instrument disposed therein may be placed into a vacuum chamber of a sterilization system. The sterilization tray may also be used to transport the medical instrument to and from a point of care. Sterilization is performed with the instrument in the base component and the lid component disposed atop the base component. Transportation is performed with the instrument in the lid component and the base component disposed atop the lid component.

**13 Claims, 4 Drawing Sheets**



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(56) **References Cited**

U.S. PATENT DOCUMENTS

6,099,812	A	8/2000	Mien et al.
6,193,932	B1	2/2001	Wu et al.
6,264,902	B1	7/2001	Howlett
6,379,631	B1	4/2002	Wu
6,572,819	B1	6/2003	Wu et al.
6,692,693	B2	2/2004	Wu
D522,813	S	6/2006	Swinford et al.
7,993,602	B2	8/2011	Moriyama et al.
2002/0191938	A1	12/2002	Sheetz et al.

OTHER PUBLICATIONS

"How to use a Microwave Sterilliser", Author: Tommee Tippee,  
Publication data: Youtube; URL: <https://www.youtube.com/watch?v=ly-drzZ-ygo> Jul. 7, 2016.



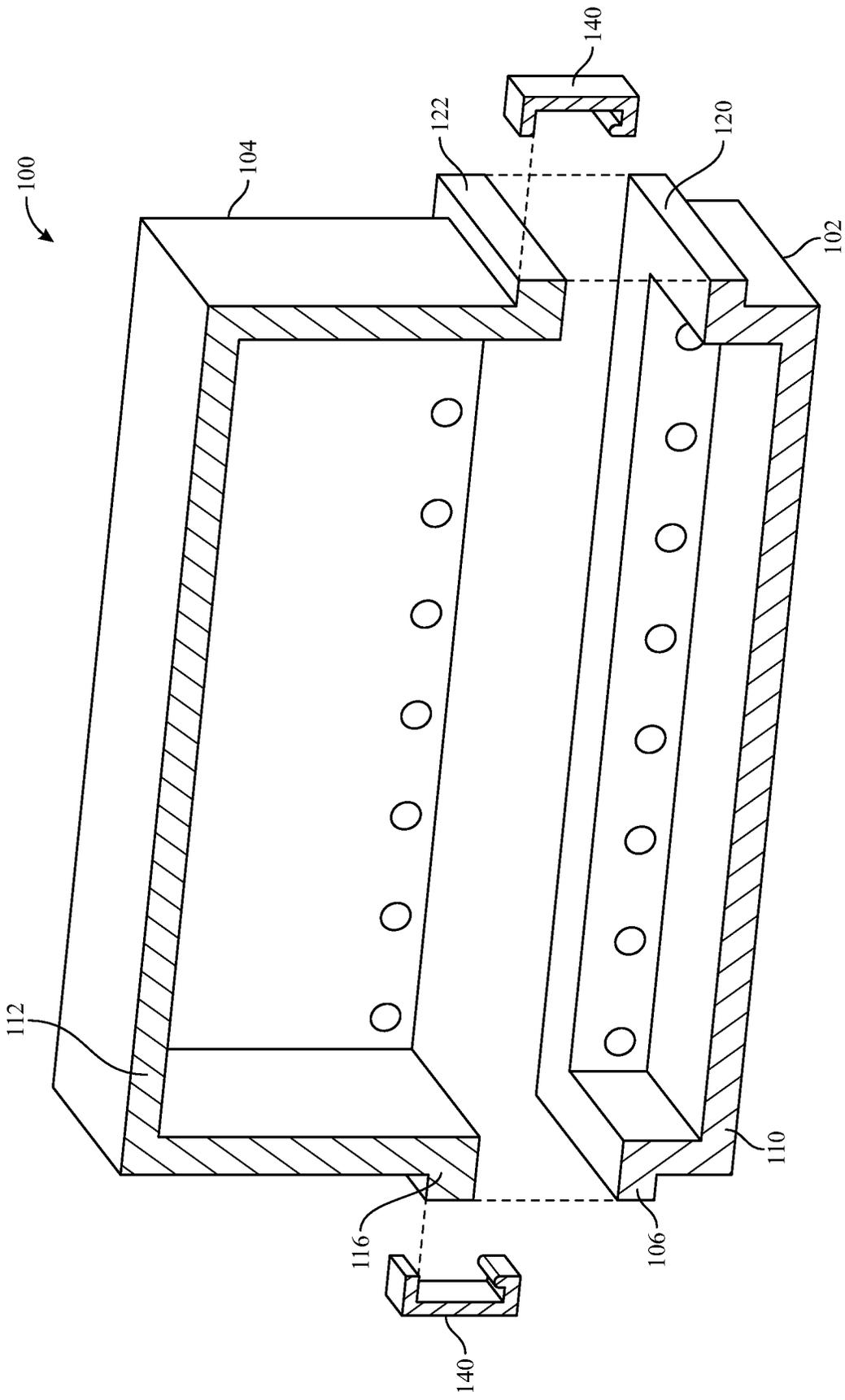


FIG. 2

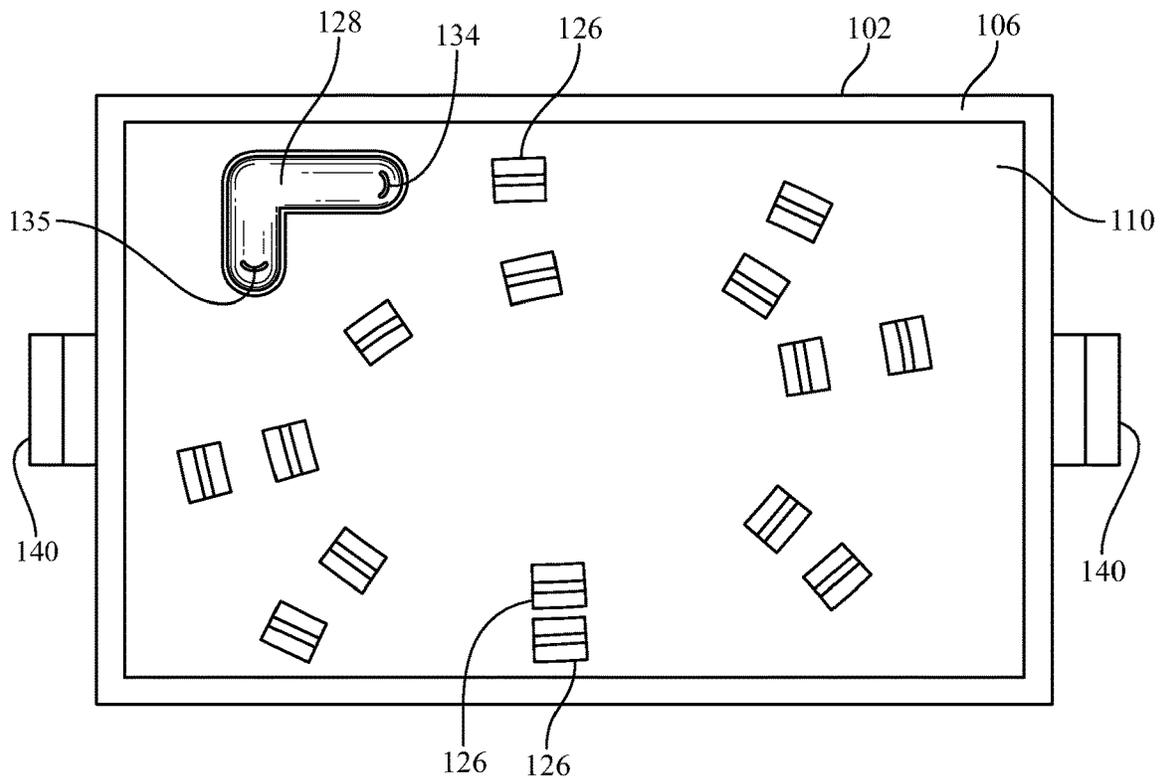


FIG. 3

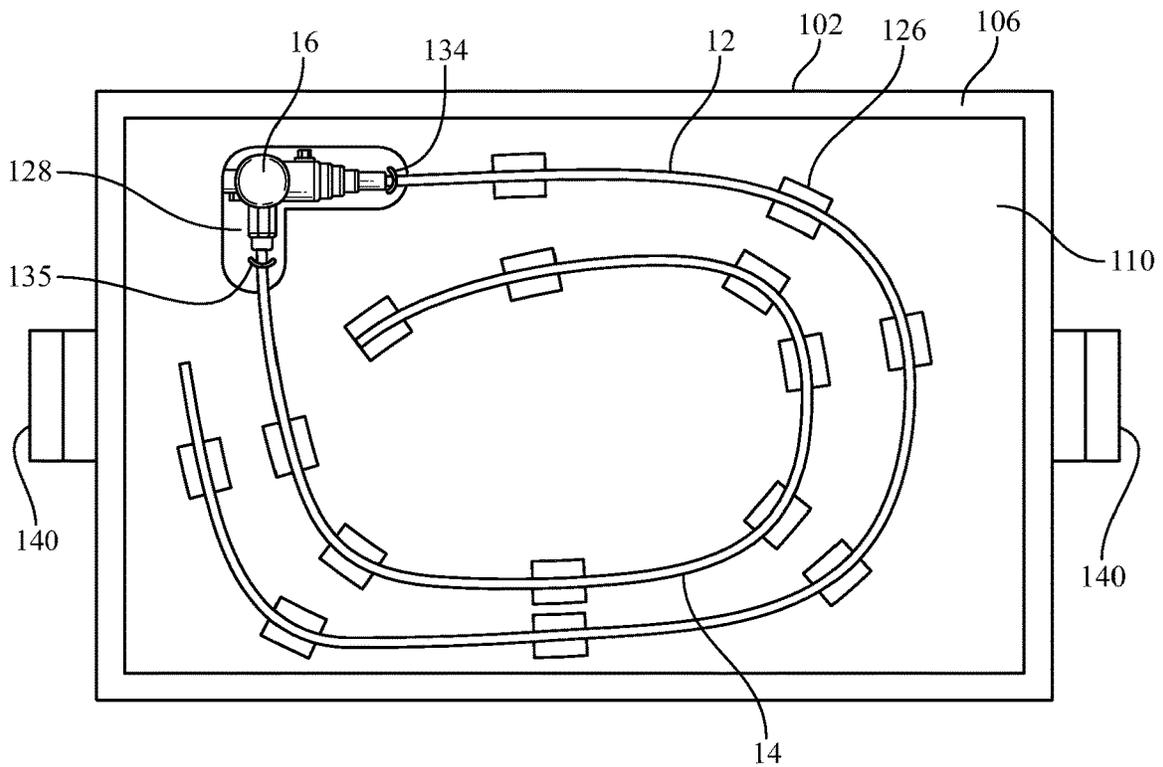


FIG. 4

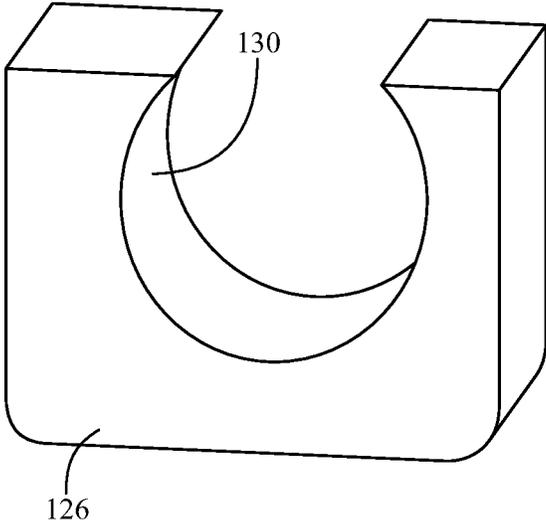


FIG. 5

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## STERILIZATION TRAY

CROSS-REFERENCE TO CO-PENDING  
APPLICATION

The present application is a Divisional application under 35 U.S.C. § 121 of U.S. patent application Ser. No. 15/828,654, filed Dec. 1, 2017. The entire contents of this application is incorporated by reference herein in its entirety.

## FIELD

The subject matter disclosed herein relates to containers used for sterilizing medical instruments.

## BACKGROUND

Endoscopes are reusable medical devices. An endoscope should be reprocessed, i.e., decontaminated, between medical procedures in which it is used to avoid causing infection or illness in a subject. The initial steps of reprocessing should be conducted immediately or shortly after the endoscope has been used in a procedure, at the point of care, to remove bioburden from an endoscope before it can dry on the endoscope. The initial steps are typically performed by a nurse and include, among others, wiping down the endoscope, soaking it in a detergent solution, suctioning detergent through the endoscope, suctioning air through the endoscope, and flushing the channels. After the initial steps are performed the endoscope may be transported to a reprocessing area for further reprocessing, such as disinfection or sterilization.

When the contaminated endoscope will be subject to a sterilization procedure, the endoscope may be placed into a sterilization tray, as is typical of sterilization procedures for medical devices. Following sterilization, the endoscope may be used in another procedure. The endoscope may be transported back to a procedure room (e.g., an operating room) in the tray in which it was sterilized or in another receptacle.

## SUMMARY

A sterilization tray is disclosed herein. A medical instrument, such as an endoscope, may be placed into the sterilization tray, and the sterilization tray with the medical instrument disposed therein may be placed into a vacuum chamber of a sterilization system. The sterilization tray may also be used to transport the medical instrument to and from a point of care. The sterilization tray may include a base component having a first top wall, a first side wall and a first bottom wall. Two brackets may be disposed upon the first wall. The brackets may be utilized to maintain an endoscope's tubes in a coiled configuration. A lid component having a second top wall, a second side wall, and a second bottom wall, may be disposed atop the base component to cover the base component. The lid component may be taller than the base component. That is, a first distance measured from the first top wall to the first bottom wall is less than a second distance measured from the second top wall to the second bottom wall. The second distance may be between approximately 1.5 times and ten times longer than the first distance. The second distance is approximately three times longer than the first distance.

At least one hole (i.e., a first hole) may be disposed through the lid component, for example, through the first sidewall. At least one hole (i.e., a second hole) may be

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disposed through the base component, for example, through the second side wall. An insert configured to maintain a body of an endoscope may be disposed within the sterilization tray. The insert may include a securing mechanism, such as an elastomeric band.

The sterilization tray may be provided. An endoscope may be placed into the lid component. The lid may be covered with the base component. The base component may be removed from the lid component. The base component may be flipped. The endoscope may be removed from the lid component. The lid component may be flipped. The endoscope may be placed into the base component. The base component may be covered with the lid component. The sterilization tray with the endoscope disposed therein may be placed into a vacuum chamber of a sterilization system. The endoscope may be sterilized.

The tray may be transported from a reprocessing area to a procedure room with the endoscope disposed within the base component and with the lid component covering the base component. The tray may be transported from the procedure room to the reprocessing area with the endoscope disposed within the lid component and with the base component covering the lid component. The endoscope may be position in the base component in a coiled configuration by securing the endoscope's tubes using the brackets.

## BRIEF DESCRIPTION OF THE DRAWINGS

While the specification concludes with claims, which particularly point out and distinctly claim the subject matter described herein, it is believed the subject matter will be better understood from the following description of certain examples taken in conjunction with the accompanying drawings, in which like reference numerals identify the same elements and in which:

FIG. 1 depicts a perspective view of a sterilization tray;

FIG. 2 depicts an exploded cross section view of the sterilization tray of FIG. 1;

FIG. 3 depicts a top view of a base component of the sterilization tray of FIG. 1;

FIG. 4 depicts the top view of the base component with an endoscope disposed therein; and

FIG. 5 depicts a bracket that may be disposed within the base component.

## DETAILED DESCRIPTION

The following description sets forth certain illustrative examples of the claimed subject matter. Other examples, features, aspects, embodiments, and advantages of the technology should become apparent to those skilled in the art from the following description. Accordingly, the drawings and descriptions should be regarded as illustrative in nature.

Endoscopes may be rather long, e.g., from approximately six to twelve feet, making them cumbersome to manage, particularly during the initial reprocessing steps at the point of care, e.g., a procedure room such as an operating room, and during transportation from the point of care to a reprocessing area. Thus, a need exists for facilitating such management of endoscopes, particularly endoscopes that are over six feet long.

FIGS. 1 and 2 show a sterilization tray **100** that includes a base component **102** and a lid component **104**. Base component **102** may include a first top wall **106**, a first side wall **108**, and a first bottom wall **110**. Lid component **104** may include a second top wall **112**, a second side wall **114**, and a second bottom wall **116**. Lid component **104** may be

disposed atop base component **102** such that it covers base component **104** to define an internal volume **118** bound by, e.g., walls **108**, **110**, **112**, and **114**. Holes **132** may be disposed through first side wall **108** and/or second side wall **114**, providing a fluid connectivity from outside tray **100** through base component **102** and/or lid component **104**, to internal volume **118**.

Base component **102** may include a first lip **120** and lid component **104** may include a second lip **122**. Lips **120** and **122** may mate to each other when lid component **104** is disposed atop base component **102**. Thus, lips **120** and **122** may form a handle that a user may grasp to lift tray **100**. A clasp **140** may be included upon or proximate to lips **120** and **122**, which may be used to secure first lip **120** to second lip **122**, which in turn secures base component **102** to lip component **104**. Clasp **140** may also be considered a handle. Although clasp **140** is shown in the figures as being detachable from lips **120** and **122**, clasp **140** may be coupled to tray **100**. For example, it may be rotatably connected to lip **122** such that it may be rotated between a first configuration in which it secures lip **120** to lip **122** and a second configuration in which it does not secure lip **120** to lip **122**.

Base component **102** may have a height,  $H_B$ , defined as the distance between first top wall **106** and first bottom wall **110**. Lid component **104** may have a height,  $H_L$ , defined as the distance between second top wall **112** and second bottom wall **116**. Accordingly, the height of internal volume **118** may be  $H_B - H_L$ . In some embodiments, base component **102** is shallower than lid component **104**. That is  $H_B$  is less than  $H_L$ . In some embodiments,  $H_L$  is approximately 1.5 times to 10 times longer than  $H_B$ . For example, in some embodiments,  $H_L$  may be three times longer than  $H_B$ .

Referring to FIGS. **3** and **4**, between one and twenty brackets, e.g., at least two brackets **126**, may be disposed upon first bottom wall **110**. FIG. **5** details an example of a bracket **126**. Bracket **126** may have an internal profile **130** that conforms closely to an insertion tube **12** and/or umbilical tube **14** of an endoscope such that the tubes may be positioned in brackets **126** to be held in place by brackets **126**. Brackets **126** may be somewhat flexible to facilitate placement of tube **12** and/or **14** therein, while still providing a secure hold. Brackets **126** may be disposed in various configurations upon first bottom wall **110** in order to maintain an endoscope in a desired configuration. For example, brackets **126** may be disposed about first bottom wall **110** in a spiral or coiled configuration such that an endoscope may be maintained by brackets **126** in a spiral or coiled configuration. An insert **128** may also be disposed upon first bottom wall **110**. Insert **128** should have an internal profile that conforms closely to a body **16** of an endoscope. Insert **128** may include a securing mechanism or mechanisms, such as elastomeric bands **134** and **135**, to secure body **16** to insert **128**. FIG. **4** shows an endoscope within base component **102**, secured by brackets **126** and bands **134**, **135** in a coiled configuration.

In use, tray **100** may be used according to the following procedure. First, at a point-of-care, e.g., in a procedure room, such as an operating room, lid component **104** may be positioned with second top wall **112** disposed below second bottom wall **116** such that an endoscope may be disposed within lid component **104** upon second top wall **112**. Initial steps of a reprocessing procedure may be performed with the endoscope disposed within lid component **104**. Second, lid component **104** may be covered by base component **102**. Further, holes **132** may be covered by, e.g., a disposable plastic film to avoid potential bioburden exposure during transportation to a reprocessing area of a healthcare facility.

Third, tray **100** may be transported, with the endoscope inside of it, to the reprocessing area. Fourth, base component **102** may be removed from atop lid component **104** and the base component flipped so that first bottom wall **110** is disposed below first top wall **106**. Fifth, the endoscope's tubes (e.g., insertion tube **12** and umbilical tube **14**) may be positioned within brackets **126**, e.g., in a coiled configuration. The endoscope's body (e.g., body **16**) may also be positioned within insert **128**. The endoscope's body may be secured to insert **128** with band **134**. Sixth, lid component **104** is disposed atop base component **102**. Seventh, tray **100** is positioned in a sterilizer, e.g., the STERRAD® System, STERRAD® NX System or STERRAD® 100NX System of Advanced Sterilization Products, Inc. Eighth, tray **100**, with the endoscope therein, is subject to a sterilization procedure. Ninth, tray **100** may be transported to a procedure room, such as an operating room. Tenth, the process may be repeated.

Accordingly, tray **100** may be considered reversible in nature. Referring to the foregoing exemplary procedure, base component **102** is disposed atop lid component **104** from the second through the fourth steps, whereas lid component **104** may be disposed atop base component **102** from the sixth through ninth steps. The reversible nature of the tray helps ease management of the endo scope and reduces the number of supplies used during a reprocessing procedure.

It should be understood that any of the examples and/or embodiments described herein may include various other features in addition to or in lieu of those described above. The teachings, expressions, embodiments, examples, etc. described herein should not be viewed in isolation relative to each other. Various suitable ways in which the teachings herein may be combined should be readily apparent to those of ordinary skill in the art in view of the teachings herein.

Having shown and described exemplary embodiments of the subject matter contained herein, further adaptations of the methods and systems described herein may be accomplished by appropriate modifications without departing from the scope of the claims. Some such modifications should be apparent to those skilled in the art. For instance, the examples, embodiments, geometrics, materials, dimensions, ratios, steps, and the like discussed above are illustrative. Accordingly, the claims should not be limited to the specific details of structure and operation set forth in the written description and drawings.

We claim:

1. A method of using a tray, comprising:  
providing the tray, the tray including,

a base component having a first top wall, a first side wall, and a first bottom wall,

a lid component having a second top wall, a second side wall, and a second bottom wall, the lid component disposed atop the base component and covering the base component,

in which a first distance measured from the first top wall to the first bottom wall is less than a second distance measured from the second top wall to the second bottom wall;

positioning the lid component such that the second top wall is disposed below the second bottom wall;

disposing an endoscope in the lid component under the second bottom wall;

covering the lid component with the base component while the endoscope is disposed in the lid component under the second bottom wall, such that the first top wall of the base component contacts the second bottom

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wall of the lid component and the first bottom wall of the base component is positioned above the first top wall of the base component;

transporting the tray from a procedure room to a reprocessing area with the endoscope disposed in the lid component and with the base component covering the lid component;

removing the base component from the lid component after the step of transporting the tray from the procedure room to the reprocessing area;

flipping the base component after the step of removing the base component from the lid component such that the first top wall is disposed above the first bottom wall;

disposing the endoscope in the base component after the step of flipping the base component;

covering the base component with the lid component after the step of disposing the endoscope in the base component, such that second bottom wall of the lid component contacts the first top wall of the base component and the second top wall of the lid component is positioned above the second bottom wall of the lid component; and

sterilizing the endoscope while the endoscope is disposed in the base component and while the base component is covered with the lid component.

**2.** The method of claim **1**, further comprising:

transporting the tray from the reprocessing area to the procedure room with the endoscope disposed in the base component and with the lid component covering the base component.

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**3.** The method of claim **2**, in which the step of disposing the endoscope in the base component comprises positioning the endoscope in the base component in a coiled configuration.

**4.** The method of claim **3**, in which the step of sterilizing the endoscope is performed before the step of transporting the tray from the reprocessing area to the procedure room.

**5.** The method of claim **4**, in which the tray further includes at least two brackets disposed upon the first bottom wall.

**6.** The method of claim **5**, in which the brackets are configured to maintain the endoscope in a coiled configuration.

**7.** The method of claim **5**, in which the second distance is between approximately 1.5 times and ten times longer than the first distance.

**8.** The method of claim **7**, in which the second distance is approximately three times longer than the first distance.

**9.** The method of claim **7**, in which the lid component includes a first hole disposed through the second side wall.

**10.** The method of claim **9**, in which the base component includes a second hole disposed through the first side wall.

**11.** The method of claim **7**, in which the tray further comprises an insert disposed on the first bottom wall, the insert having an internal profile that conforms to a body of an endoscope.

**12.** The method of claim **11**, in which the insert includes a securing mechanism.

**13.** The method of claim **12**, in which the securing mechanism comprises an elastomeric band.

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